

HR-235 Warrants for Rumble Strips on Rural Highways

Abstract

Research was undertaken, sponsored by the Iowa Department of Transportation, to identify specific locations where rumble strips could be expected to improve highway safety. The objective of the research was to recommend warrants for their use on rural highways.

An inventory of rumble strip installations on the rural highway systems in the state was conducted in 1981. a total of 685 installations was reported on secondary roads and 147 on primary highways. Over 97 percent of these were in advance of stop signs at intersections. Most of the other installations were in advance of railroad grade crossings.

The accident experience with and without rumble strips was compared in two ways. A before-and-after comparison was made for the same location if accident records were available for at least one full year both preceding and following the installation of rumble strips. Accident records for this purpose were available from a statewide computerized record system covering the period from 1977 through 1980. The accident experience at locations having rumble strips installed before 1978 was compared with a sample of comparable locations not having rumble strips.

The secondary road sample used for the before-and-after comparison included 88 locations. There were also 119 locations having rumble strips in the sample for which the accident experience was compared with 119 comparable locations that did not have rumble strips. Some of these were deleted from the sample for analysis since they were unique types of installations where no accidents were experienced during the period for which records were available. The primary highway sample included 21 locations with before-and-after accident experience and 28 locations having rumble strips that were matched with 28 comparable locations without rumble strips. Comparisons were made on the basis of both the total number of accidents and the number of accidents attributed to running a stop sign.

There was no difference in the accident experience of secondary road locations between the periods before and after the installation of rumble strips. Secondary road locations having rumble strips for longer periods experienced slightly more accidents than comparable control locations without rumble strips.

At primary highway locations in the before-and-after sample, the accident experience following the installation of rumble strips was significantly lower than it had been before their installation. There was little difference in accident rates between the control locations and primary highway locations with rumble strips installed before 1978.

However, no correlation could be demonstrated between the occurrence of accidents at the locations in the sample and factors including traffic volume, sight distance, and distance from the last stop. Analysis of the before-and-after samples indicated that the accident rate could be expected to improve following installation of rumble strips only if it were fairly high preceding their installation, above 2.5 accidents/MEV at secondary locations and above 2.0 accidents/MEV at primary locations.

These conclusions let to a recommendation that the installation of rumble strips should be considered at intersections experiencing accident rates in excess of those stated above if the results of an engineering study indicate that their installation will exert a beneficial effect on highway safety. It was also recommended that rumble strip installations should conform with the standard design prepared by the Iowa DOT.